WHAT IS CLAIMED IS:

1. A process for preparing a toughened polymer composition, comprising the steps of:

combining a rubber component and a matrix polymer, said matrix polymer being a polyolefin;

crosslinking the rubber component with a crosslinking agent at a temperature above the melting point of the matrix polymer to form a thermoplastic elastomer component; and

blending the thermoplastic elastomer component with a thermoplastic polyolefin polymer component to form the toughened polymer composition, said thermoplastic polyolefin polymer comprising at least 50% by weight of a homopolymer.

2. A process according to claim 1, wherein the rubber component is present in an amount from about 2 to about 60 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin polymer component.

3. A process according to claim 2, wherein the thermoplastic polyolefin polymer component is derived from at least one olefin monomer having from 2 to about 14 carbon atoms, wherein the matrix polymer is derived from at least one olefin monomer having from 2 to 14 carbon atoms, and wherein the rubber component is derived from at least two different alpha olefin monomers, or could be styrene butadiene rubber, hydrogenated styrene butadiene rubber, butyl rubber, butyl-alphamethyl styrene copolymer or derivatives thereof, styrenic block copolymer, acrylic rubber, nitrile rubber, hydrogenated nitrile rubber, or ethylene methacrylate terpolymer rubber, or any combination thereof.

4. A process according to claim 3, wherein the crosslinked rubber component has an average particle size of about 0.005 to about 25 microns, and wherein the thermoplastic elastomer component and thermoplastic polyolefin polymer component are melt blended.

5. A process according to claim 1, wherein said thermoplastic polyolefin polymer component is derived from ethylene, propylene, butene, pentene, hexene, heptene, 2-methyl-1-propene, 3-methyl-1-pentene, 4-methyl-1-pentene, and 5-methyl-1-hexene, or a combination thereof, and wherein said rubber component is ethylene propylene rubber, EPDM rubber, or a combination thereof.

6. A process according to claim 5, wherein the rubber component is present in an amount from about 40 to about 90 parts by weight per 100 parts by weight of the rubber component and the matrix polymer, and wherein the rubber component is present in an amount from about 5 to about 50 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin polymer component.

7. A process according to claim 2, wherein the rubber component is present in an amount from about 10 to about 45 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin polymer component.

8. A process according to claim 7, wherein the crosslinked rubber component has an average particle size of from about 0.1 to about 10 microns, wherein the rubber is crosslinked at a temperature of at least 10°C higher than the melt temperature of

the matrix polymer, and wherein blending of the thermoplastic elastomer component and the thermoplastic polyolefin polymer component is conducted at a temperature greater than 10°C above the melting point of the thermoplastic polyolefin polymer component.

9. A process according to claim 8, wherein the thermoplastic polyolefin polymer component is polyethylene or polypropylene, and wherein the matrix polymer is derived from ethylene, propylene, or 4-methyl-1-pentene.

10. A process according to claim 9, wherein the toughened polymer composition contains less than 35 parts of oil, based on 100 parts by weight of the rubber component, and wherein the rubber component is present in an amount from 18 to about 45 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin polymer component.

11. A method for producing rotationally molded articles having toughness, comprising the steps of:

introducing a toughened polymer composition into a mold of a rotational molding device, said toughened polymer composition comprising a thermoplastic polyolefin component and a thermoplastic elastomer component comprising a matrix polymer and a crosslinked rubber component, said matrix polymer being a polyolefin, said thermoplastic polyolefin component comprising at least 50% by weight of a homopolymer; and

rotationally molding at least the toughened polymer composition thereby forming an article.

12. A method according to claim 11, wherein the rubber component is present in an amount from about 2 to about 60 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

13. A method according to claim 12, wherein the thermoplastic polyolefin component is derived from at least one olefin monomer having from 2 to about 14 carbon atoms, wherein the matrix polymer is derived from at least one olefin monomer having from 2 to 14 carbon atoms, and wherein the rubber component is derived from at least two different alpha olefin monomers, or is styrene butadiene rubber, hydrogenated styrene butadiene rubber, butyl rubber, butyl-alphamethyl styrene copolymer or derivatives thereof, styrenic block copolymer, acrylic rubber, nitrile rubber, hydrogenated nitrile rubber, or ethylene methacrylate terpolymer rubber, or a combination thereof.

14. A method according to claim 13, wherein the crosslinked rubber component has an average particle size of 0.005 to about 25 microns, and wherein the thermoplastic elastomer component and thermoplastic polyolefin component are melt blended.

15. A method according to claim 11, wherein said thermoplastic polyolefin component is derived from ethylene, propylene, butene, pentene, hexene, heptene, 2-methyl-1-propene, 3-methyl-1-pentene, 4-methyl-1-pentene, and 5-methyl-1-hexene, or a combination thereof, and wherein said rubber component is ethylene propylene rubber, EPDM rubber, or a combination thereof.

16. A method according to claim 15, wherein the rubber component is present in an amount from about 40 to about 90 parts by weight per 100 parts by weight of the rubber component and the matrix polymer, and wherein the rubber component is present in an amount from about 5 to about 50 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

17. A method according to claim 16, wherein the rubber component is present in an amount from about 10 to about 45 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

18. A method according to claim 17, wherein the crosslinked rubber component has an average particle size of from about 0.1 to about 10 microns, wherein the rubber is crosslinked at a temperature of at least 10°C higher than the melt temperature of the matrix polymer, and wherein blending of the thermoplastic elastomer component and the thermoplastic polyolefin component is conducted at a temperature greater than 10°C above the melting point of the thermoplastic polyolefin component.

19. A method according to claim 18, wherein the thermoplastic polyolefin component is polyethylene or polypropylene, and wherein the matrix polymer is derived from ethylene, propylene, or 4-methyl-1-pentene.

20. A method according to claim 19, wherein the toughened polymer composition contains less than 35 parts of oil based on 100 parts by weight of the rubber component, and wherein the

rubber component is present in an amount from 18 to about 42 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

21. A toughened thermoplastic composition, comprising:

a blend including a) a thermoplastic polyolefin component, said thermoplastic polyolefin component comprising at least 50% by weight of a homopolymer and b) a thermoplastic elastomer component derived from a rubber component crosslinked in the presence of a matrix polymer, said matrix polymer being a polyolefin, the rubber component being present in an amount from about 2 to about 60 parts per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

22. A composition according to claim 21, wherein the thermoplastic polyolefin component is derived from at least one olefin monomer having from 2 to about 14 carbon atoms, wherein the matrix polymer is derived from at least one olefin monomer having from 2 to 14 carbon atoms, and wherein the rubber component is derived from at least two different alpha olefin monomers, or is styrene butadiene rubber, hydrogenated styrene butadiene rubber, butyl rubber, butyl-alphamethyl styrene copolymer or derivatives thereof, styrenic block copolymer, acrylic rubber, nitrile rubber, hydrogenated nitrile rubber, or ethylene methacrylate terpolymer, rubber or a combination thereof.

23. A composition according to claim 22, wherein the crosslinked rubber component has an average particle size of about 0.005 to about 25 microns, and wherein the thermoplastic

elastomer component and thermoplastic polyolefin component are melt blended.

24. A composition according to claim 23, wherein said thermoplastic polyolefin component is derived from ethylene, propylene, butene, pentene, hexene, heptene, 2-methyl-1-propene, 3-methyl-1-pentene, 4-methyl-1-pentene, and 5-methyl-1-hexene, or any combination thereof, and wherein said rubber component is ethylene propylene rubber, EPDM rubber, or a combination thereof.

25. A composition according to claim 24, wherein the rubber component is present in an amount from about 5 to about 50 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

26. A composition according to claim 25, wherein the rubber component is present in an amount from 45 to 70 parts by weight per 100 parts by weight of the rubber component and the matrix polymer, and wherein the rubber component is present in an amount from about 10 to about 45 parts by weight per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.

27. A composition according to claim 26, wherein the crosslinked rubber component has an average particle size of from about 0.1 to about 10 microns, wherein the rubber is crosslinked at a temperature of at least 10°C higher than the melt temperature of the matrix polymer, and wherein blending of the thermoplastic elastomer component and thermoplastic polyolefin component is conducted at a temperature greater than 10°C

above the melting point of the thermoplastic polyolefin component.

28. A composition according to claim 27, wherein the thermoplastic polyolefin component is polyethylene or polypropylene, and wherein the matrix polymer is derived from ethylene, propylene, or 4-methyl-1-pentene.

29. A composition according to claim 28, wherein the toughened polymer composition contains less than 30 parts of oil, based on 100 parts by weight of the rubber component, and wherein the rubber component is present in an amount from about 18 to about 42 parts per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component.